

IN THE CLAIMS

Please amend the claims and add new claims 12-15 as follows:

1. (Currently Amended) A system for managing drainage system design comprising:
 - a computer;
 - an input device for accepting GPS data into said computer, said GPS data comprising a plurality of data points collected in sections;
 - means within said computer for mapping a field using said plurality of data points;
 - means within said computer for designing constructing a drainage system design from said GPS data,
 - means for generating a cost estimate for said drainage system, and
 - means for producing an instruction set for tooling machines installing said drainage system.

2. (Original) The system of claim 1 comprising:
 - a mobile vehicle for collecting survey data in GPS format.
3. (Currently Amended) The system of claim 1 wherein said mobile vehicle carries carries an RTK system.
4. (Original) The system of claim 1 wherein the mobile vehicle is selected from the group consisting of: ATVs, construction equipment, tractors, trucks, cars, boats, ships, helicopters, and airplanes.
5. (Original) The system of claim 1 further comprising:
 - a tooling means for installing said drainage system according to said instruction set produced by said management means.
6. (Original) The system for managing drainage system design of claim 1 wherein the management means is a personal computer.

7. (Currently Amended) A method of managing drainage system design comprising:

gathering GPS data of a field needing a drainage system, said GPS data comprising coordinates of a plurality of points along a perimeter of said field;

constructing a drainage system design from said GPS data;

generating a cost estimate for said drainage system; and

producing an instruction set for tooling a machine installing said drainage system.

8. (Original) The method of managing drainage system design of claim 7 further comprising forming a contour map of the field.

9. (Original) An improved tiling machine for clearing sub surface areas, said tiling machine having an on-board computer and a GPS device, the improvement comprising:

a GPS-based instruction set downloaded into and executed by said on-board computer for controlling grade and depth of sub surfaces areas cleared by the tiling machine.

10. (Original) A system for installing sub surface systems in a designated area comprising:

a field computer comprising logic instructions for surveying and mapping a designated area with GPS coordinates;

a Real-Time Kinematic Differential Global Positioning System device electronically connected to said field computer for collecting survey data points;

an automated machine tool for installing sub surface components having a computer for controlling the grade according to an instruction set;

a management computer comprising logic instructions for preparing a contour map from latitude, longitude, and altitude coordinates, a sub surface system design, preparing an instruction set to control the machine tool grade, and calculating cost estimates for the sub surface system design; and

at least one I/O means for transferring data between the field computer, the management computer, and the automated machine tool.

11. (Currently Amended) An article of manufacture comprising:

a computer program product, said computer program product comprising a means for grid initialization, a means for dropping a point on a grid, a means for querying the altitude of the point, and a means for generating topographic lines, wherein said grid initialization comprises means for identifying a bounding box according to longitudes and latitudes of a plurality of points on a perimeter of said bounding box.

12. (New) A method of managing drainage system design according to claim 7, wherein said step of gathering comprises:

collecting and recording a plurality of latitude and longitude coordinates at predetermined intervals around a perimeter of a field; and
collecting a plurality of data points within said field in sections.

13. (New) A method of managing drainage system design according to claim 12 wherein said sections comprise of swaths of varying widths dependant upon the topography.

14. (New) A method of managing drainage system design according to claim 12 wherein said plurality of data points within each section of said field comprise coordinates of a high point and low point in said section.

15. (New) A method of managing drainage system design according to claim 14 wherein said plurality of data points within each section further comprise coordinates of at least one depression.